The party had suffered from two or three attacks of aphonia. In June, 1849, she was attacked with double pneumonia, but upon the subsidence of this disease, the cough continued. She expectorated mucous sputa, and did not regain lost flesh; hectic fever recurred daily; pulse slow, except during paroxysm of fever. About the first of September, examination of the lungs gave the following: Slight dulness under humeral end of left clavicle; roughened inspiration, and audible and prolonged expiration; the symptoms gradually grew worse till November, when auscultation gave evidence of softened tubercles and cavities formed in left lung; expectoration became purulent; emaciation was considerable; was confined to her room, and part of the time to her bed; at this time she was placed on use of cod-liver oil, a tablespoonful three times a day; in course of four or five weeks showed signs of improvement; coughed and expectorated less, and began to improve in flesh. In February was able to be about the house and attend to light duties; during the last part of spring, exchanged calls with her friends. One evening in the last of May played and sang the whole evening with a party of friends; the next morning she had an attack of profuse hæmoptysis; these recurred repeatedly, and she sank under the hemorrhage, and died June 17th, 1850.

To the kindness of Dr. Fabgan, I am indebted for the following case:—

H. C. A., seamstress; aged thirty-three; above medium height, and of slight figure; three or four of the family had died of consumption; she had been six weeks sick when first seen, which was on Dec. 30th, 1850. *Symptoms.*—A quick small pulse; severe cough; mucous expectoration; considerable emaciation; pains in chest, and a feeling of tightness across it. *Physical signs.*—Dulness at apex of right lung; bronchial respiration and subcrepitant râles. About the middle of January, was placed on the use of cod-liver oil; not a fortnight had elapsed before she began to improve, and at the end of two months all the above-mentioned symptoms had disappeared, and she was more fleshy than when in good health.

In the foregoing abstract of cases, I have aimed at brevity, in order not to prolong this paper to too great a length; but I fear that the notes of some of the cases are so imperfect as to be uninteresting, and of no practical value.

PROVIDENCE, *March* 19*th*, 1851. No. 172 Benefit Street.

ART. VIII.—*On the Uses of the Eustachian Valve.* By R. RANDOLPH, M. D., of Pennsylvania.

THE provision in the fœtal heart which has received the above designation, although comparatively insignificant as to the space which it may fill in the wide field of physical research, has not failed to obtain from the observers of nature an occasional notice and conjectural comment. There are two such instances, at least, which claim attention, in which the suggestions advanced have met with free currency and a share of reputation. But of these it may be safely said that, while they are recommended by an essential similarity, neither of them has been universally received with absolute satisfaction; and a close examination of them must, I think, bring to light a want of accuracy and completeness sufficient to account for the existence of some reserve in the approval of those who have been led elsewhere to appreciate the mutual fitness and subserviency which prevail among created things, irrespective of apparent magnitude.

In accordance with the hypothesis of Sabatier, the Eustachian valve has been often represented as an essential contributor to the development of the brain. By shielding, that is, the upward and placental current of blood, upon its entering the right auricle, from the more thoroughly venous stream of the cava descendens, and by directing the former, in a degree uncontaminated, into the route which leads to the head and upper extremities. Professor Wistar found for it another service (dependent, of course, upon the same direct action of the valve) in the securing of a like supply to the heart itself, whose labours are already so considerable and so obvious as to furnish a notable pretext for such a distinction. Whatever the respect to which these views may have formerly been entitled, either on the ground of authorship, or on that of intrinsic plausibility in the then less advanced state of anatomical science, one simple and well-known circumstance of itself forbids our regarding them in the present day as altogether adequate: namely, that the value is found proportionally largest at the earliest stages of its existence, when the otherwise imperfect condition of the heart nevertheless insures a speedy coalition of the two dissimilar currents. For the septum of the ventricles is not completed until about the end of the second month of the embryo, while the Eustachian valve is heard of (as may hereafter be seen) weeks previously. The heart in the mean time consists of a ventricle and two auricles; the embryo, in this particular, having reached a position in the progress of development corresponding to that occupied by the reptile in the fixed scale of animate nature.*

What is the function of the Eustachian valve at that earlier date?

Confining our attention to the heart itself, we recollect that both venæ cavæ discharge into the right auricle; and that, during intra-uterine existence, there is no supply by way of the pulmonary veins, even when these have been formed; the left auricle would therefore be entirely out of the route of the circulation, except for the deficiency (foramen ovale) in the auricular septum;

---

* Authorities appear to differ respecting the exact date of the septum of the auricles. The question is a verbal one so far as relates to the present subject, some circumlocution merely being avoided by the view above assumed, *i. e.* that it exists prior to the septum of the ventricles. Under the contrary supposition, the chief difference would be that, instead of speaking of the "left auricle," we should have to do with such phrases as "that portion of the common auricle which is afterward to become the left auricle," &c. The assumption of the text has evidently the authority of analogy in its favour.

the ventricular cavity, we have just seen, is at this time one and undivided. With these facts only before us, we might readily conceive that, at the instant when a contraction of (both of) the auricles occurs, accompanied by the ventricular expansion, there should be a tendency for all the blood which passes through the right auricle, to rush directly into the common ventricle by the right ventricular opening; that this course, which might at first be maintained by the expense of an unnatural rapidity at the entrance chosen, would be afterward confirmed by an enlargement of that entrance; and that the left auricle, not being then needed, would not be found in its place when its services are called for. Against such a defect as this, the Eustachian valve may be supposed to provide. By the interposition of that barrier, the access of the blood to the ventricle by the right orifice being necessarily impeded, it may be inferred that the requisite detachment is forced to adopt the more circuitous course of foramen ovale, left auricle, and left ventricular opening; and that the left auricle, and the forming mitral valve, by thus receiving employment, are ensured existence.

The constant diminution which so early commences in the relative size of the valve may be attributed to the development of the septum of the ventricles. As that advances, the exigency which has been represented may decrease, though it cannot yet be supposed entirely to disappear, especially whilst that partition is in its most recent and feeble state. For, so long as the right auricle continues to be, as it were, the centre of the circulation, and the ductus arteriosus continues to furnish a more direct route to the arch of the aorta by way of the right ventricle, in other words, until the close of the fœtal term, the unaided septum might be in danger of yielding before the greater momentum which would be necessarily induced at the right side, were there no check remaining at the site of the Eustachian valve. The natural action of the parts might thus still tend excessively to develop the right auricle at the expense of the left, as well as to restore the unity of the ventricles by the rupture or the gradual distension of their septum.

As a general expression, then, of the inference which has been here urged, it may be said that it is the primary office of the Eustachian valve to furnish the function, and so to originate the development, of the left auricle of the heart; and that it subsequently defends that function and that development until the changes which occur in the circulation at birth render such a chamber, for the first time perhaps, absolutely indispensable.*

The observations contained in the brief extracts which follow appear to me so nearly to have anticipated this conclusion, that I should scarcely have been thus backward in introducing them, had it not been with the hope of thereby making their value more conspicuous to the reader:—

---

* For the account of a case in which one auricle, with three ventricles, constituted the heart of *two* "perfectly-formed and well-developed" fœtuses united at the sternum, (extracted from the *Edinburgh Medical and Surgical Journal,*) see *Ranking's Half-Yearly Abstract*, No. VI.

"At six weeks the Eustachian valve forms a distinct" (of course not complete) "partition, behind which are the *orifices of both venæ cavæ and the foramen ovale.*" * * * "At two months, the right auricle has become sufficiently large to be examined with the naked eye. The crescent of the Eustachian valve describes a larger curve, and allows a freer communication between the anterior and posterior cell of the auricle. At two months and a half, the orifice of the superior cava is higher up, but still covered by the Eustachian valve. At three months and a half, there is but little of this vein covered by the valve, and now therefore the blood of the two cavæ mixes in the whole auricle, and not in its posterior cell only."*

The extent of the Eustachian valve, in its earlier phases, and its attitude toward the different orifices of the auricle, as thus presented to us, are perhaps too significant to be here enlarged upon with reference to the preceding argument. According to the same evidence, it may be further observed that the separation of the upward and downward currents assumed by Sabatier, cannot have place before the last of the periods cited. It may be supposed to gain place afterward as a subordinate function, which, so far as it exists, is without doubt requisite for the after distribution which that author has traced to it, and which must so evidently ensue. But other indications for such separation, while less distant, are perhaps equally imperative. That pointed out by Wistar would appear quite as much so as any that could be deduced from aught that we could *à priori* have assumed as to the necessities of the fœtal brain. Another we may hold to be such as is answered by the mere presence, in the left cavities, of the *quality* of blood which should be thus introduced there. By the supposition, a fluid approaching in its character to the arterial of after life, being offered to that incipient susceptibility which is destined to maintain the action of this side of the heart, applies its appropriate stimulus: this peculiar endowment of the left chambers, and the corresponding qualification in the nature of the blood which is thrown into them, continuing to co-operate and to improve together, the heart becomes duly prepared to meet and respond to the important crisis, at which an unadulterated fluid reaches it through the pulmonary veins.

It is very conceivable that, toward the end of the fœtal term, when the internal equilibrium and symmetry of the heart have become somewhat confirmed by the increased development and efficiency of its other parts, the main design which has been here ascribed to the Eustachian valve, now resolved into the mere protection of that equilibrium and symmetry, may be overtaken, or finally surpassed in importance, by such other duties as may thus, incidentally as it were, devolve upon it.

The subsequent imperfect and variable condition of the valve, it must be admitted, forbids the ascription to it of any constant function in the perfect subject. Is it not possible that its persistent vestiges may have their use in assisting to maintain such disturbance of the blood in the right cavities of the heart as may be sometimes necessary to prevent coagulation in the cases of congestion which frequently occur, in health and in disease, from sudden and transient pulmonary obstruction?

---

* Martin St. Ange: Prize Report to the French Academy of Sciences in 1832, cited in *Flood on the Arteries, &c.* London, 1839.

Art. IX.—*Contributions to Practical Dermatology.* By Silas Durkee, M.D.

(Read before the Suffolk District Medical Society, Boston.)

Eczema Impetiginodes.—Alfred H., aged 67 years, day-labourer, small stature, feeble constitution, temperate habits, weight about 120 pounds. He gave the following account of himself. His disease appeared about thirty years ago, and for several years was confined to the hairy scalp and the face; and from his description I judge the case to have been simple eczema originally. After the lapse of some dozen years, the malady disappeared entirely from the head, and left no trace of its existence there except a partial loss of hair. Upon leaving the head, it broke out in various other places, sometimes on one spot, sometimes on another. He stated that he had spent most of his life in the interior of New York, and that he had done whatever his circumstances would allow for the amelioration of his complaint, which was considered to be a bad case of scrofula by the physicians who had prescribed for it.

He called upon me for medical advice on the 18th of December, 1848. Upon examination, I found that the disease embraced the whole of the neck, except a small portion of integument that covered the trachea. The skin presented a highly inflamed and excoriated appearance. In some spots it was covered with thin laminated scales; but the greater part of it was not defended by even such a covering. It was hypertrophied, and sprinkled over with numerous transparent vesicles and yellow-headed pustules. From this region there was an exudation of thin fluid, which produced irritation and smarting, and was a source of almost ceaseless torment to the patient. He experienced no little inconvenience whenever he attempted to move his head, especially in a lateral direction, as the skin could not be put upon the stretch without producing more or less pain. He was poorly clad; and another source of suffering to him was the exposure of the part to the attrition of the cold air. On each side of the neck he wore a pad of rags, which shielded the lower portion of the abraded surface, while it absorbed the moisture that was continually effused upon it.

Upon the shoulders, back, and abdomen, were numerous irregular blotches of thin crustaceous squamæ, varying in size from half an inch to two inches or more in diameter, some of them being in nearly a dry condition, while from the others the puriform matter that was discharged, required the parts to be covered with bits of rag or lint. The chest and shoulders were sprinkled over with a great number of isolated pustules, which had remained nearly stationary for a long period. They were much larger than is commonly seen in pure impetigo. They were likewise more elevated above the surrounding tissue than is usually the case in that eruption, and might easily have been mistaken for acne pustulosa.